

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Review of Part 87 of the Commission's Rules)	
Concerning the Aviation Radio Service)	
)	WT Docket 01-289
)	
To: The Commission)	

REPLY COMMENTS OF ROCKWELL COLLINS, INC.

Pursuant to Section 1.415 of the Federal Communications Commission's ("Commission's" or "FCC's") rules, Rockwell Collins, Inc. ("Rockwell Collins") hereby files electronic reply comments in the above referenced proceeding,¹ which seeks to consolidate, revise, and streamline the Part 87 rules governing the Aviation Radio Service.

As pointed out in the Comments filed in the above docket, Rockwell Collins manufactures a complete line of civilian and military aeronautical radio communications, navigation, and surveillance equipment, including Instrument Landing System (ILS) receivers, L-Band Distance Measuring Equipment (DME), Traffic Alert and Collision Avoidance units, Air Traffic Control Radar Transponders, L-Band aeronautical mobile satellite communications equipment, C-Band Radio Altimeters, Microwave Landing System (MLS) receivers and weather radars. Therefore, Rockwell Collins is a party in interest to this proceeding.

¹ See In the Matter of Part 87 of the Commission's Rules Concerning the Aviation Radio Service, WT Docket No. 01-289, Notice of Proposed Rulemaking, 66 Fed. Reg. 64785 (December 14, 2001)("NPRM").

DISCUSSION

The Commission presented numerous issues in the above docket. Most issues were addressed by Rockwell Collins and generally supported by interested parties. However, Rockwell Collins respectfully requests the Commission accept additional comments as well as reply comments.

A. Innovative Technologies.

Rockwell Collins as well as the other parties submitting comments support the Commission's goal that the Commission's rules should reflect the most recent technological advances and that the adoption of technology should not be impeded by outdated regulations.² UPS Aviation Technologies submitted proposed changes to the Commission's rules in order to permit new technological advances.³ The Boeing Co. submitted comments supporting revising the Commission's rules to permit more flexibility for satellite networks utilizing other technical or operational configurations.⁴ Except for providing this information to the FCC for informational purposes, Rockwell Collins continues to believe the Commission should eliminate all technical requirements that are specific to data rates, modulation types, and bandwidth limitations to accommodate future waveforms. However, , while preventing interference to other users within the AMS(R)S band, we understand that the Commission may prefer a more cautious approach.

Absent eliminating all technical requirements, Rockwell Collins suggests changing Part 87 in order to permit a new and innovative aeronautical waveform that will provide voice and

² See Comments of Boeing at 1; Comments of ARINC and ATA at 2; and Comments of Honeywell at 1.

³ See Comments of UPS Aviation Technologies.

⁴ See Comments of Boeing at 10.

data for passengers and airline communications.⁵ This new waveform provides significantly higher data rates than currently supported by the Commission's rules. The higher data rates are implemented by using low rate Binary Phase Shift Keying ("BPSK") signaling channel at 3000 bits/sec and a 16-QAM (Quadrature Amplitude Modulation) modulation waveform at a 33.6 kHz symbol rate over the 1545-1559MHz (receive) and 1646.5-1660.5 MHz (transmit) frequencies. Therefore, modifications to Part 87 are necessary if this new service is to be accommodated and we offer the following:

Recommended Changes to Part 87

87.131 Power and Emissions: Class of station is "Aircraft Earth" and Authorized Emissions to be added are: "D1D, D1E, and D1W."

87.133 Frequency Stability: Due to the higher bandwidth of the signal, the tolerance +/- 1250 Hz for Aircraft Earth Stations over the frequency band.

87.137 Types of Emission: The following additions to the emissions table are necessary to support this new service:

Class of Emission	Emission Designator	Authorized Bandwidth (kHz) (Above 50 MHz)
D1D ^{16*}	40K0D1D	45
D1E ¹⁶	40K0D1E	45
D1W ¹⁶	40K0D1W	45

* Refers to Footnote 16.

87.139 Emission Limitations: 87.139(i) should be modified to add the emission types D1D, D1E, and D1W. 87.139(i)(1) and (i)(4) as proposed in the NPRM (with the clarifications requested in our previous comments) are sufficient with the addition of $SR=0.25 \times \text{channel rate}$ for 16-QAM.

87.141 Modulation Requirements: 87.147(j) should be modified to state "Transmitters used at Aircraft Earth Stations must employ BPSK for transmission rates up to and including 3000 bits per second, QPSK for higher data rates up to and including 21000 bits per second, and 16-QAM for data rates above 21000 bits per second."

⁵ In our comments at 10, Rockwell Collins was unable to offer specific technical suggestions and modifications to Part 87 and present them here.

87.145 Acceptability of Transmitters for Licensing: 87.145(d) contains a general requirement that aircraft earth stations must compensate their transmit frequency for Doppler effect relative to the satellite. While the general Doppler compensation requirement holds true for our new equipment, the specific limit of +/- 335 Hz is too restrictive. We recommend that the language be changed to read: "The transmitted signal may not deviate more than +/- 383 Hz from the desired transmit frequency."

2. Expanded Frequencies Available for AMS(R)S.

Rockwell Collins acknowledges Boeing's statement that Article S44 and S45 of the International Telecommunications Union ("ITU") Regulations mandate that a satellite operator carrying aeronautical communications must provide intra-network priorities for AMSS safety and distress communications.⁶ Boeing also commented that intra-network priority and preemption can already be ensured through other means, such as FAA regulations, RTCA standards, ITU radio regulations or through contractual arrangements.⁷

Rockwell Collins believes that without a mandate by the Commission, there is little likelihood that coordination difficulties between MSS and AMS(R)S uses will not be a problem. Unfortunately, neither FAA regulations nor RTCA standards apply to other non-aeronautical users on the same network who may need to be preempted. These regulations only have legal authority over the avionics. To be effective, the Priority and Preemption method chosen must consider all system resources that may need to be preempted including RF spectrum, Ground Earth Station resources, and non-AMS(R)S terminals.

Boeing's assertion that CDMA could in essence provide a capability similar to priority and preemption by allowing the high priority user to increase their power may have technical merit. At issue is whether demonstrating an effective priority and preemption mechanism (by any technical means) should remain a requirement. Rockwell Collins feels that it is appropriate

⁶ Boeing's Comments at 6, footnote 16.

for Part 87 to retain the requirements to demonstrate an effective Priority and Preemption mechanism.

As stated in our Comments, unless priority and real-time preemptive access capability is designed into system protocols for all terminals (not just aircraft terminals), public correspondence traffic will become a competitor for system resources instead of the additional bands being a pool of additional resources that can be re-assigned to safety-related traffic when necessary.⁸ In addition, protecting the availability of aircraft frequency resources to support safety-of-life communications is essential to the nature of AMS(R)S communications in bands where non-safety communications are also allowed.

⁷ Id at 5, 6.

⁸ See Rockwell Collins Comments at 5.

Conclusion

Rockwell Collins supports the Commission's desire to reflect technological advances affecting the aviation radio service. Rockwell Collins is submitting regulatory changes which will permit new abilities and uses in current radio spectrum. We respectfully request that the Commission give due consideration to new technologies being introduced which will allow high speed data transfer to and from airplanes. Rockwell Collins looks forward to working with the Commission on these important issues. Please direct any questions to Joe Cramer at 703-516-8213.

Respectfully Submitted,

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